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1919

no. 3

Engineering

ENGINE STORAGE

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JAS. POWELL,
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OFFICIAL PROCEEDINGS Meeting of March, 1919.

Volume XVIII.
No. - - - 3

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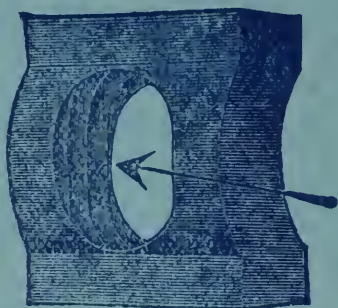
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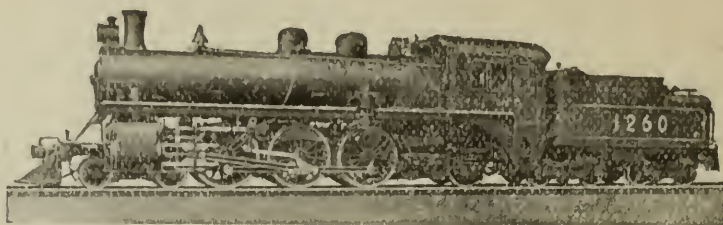
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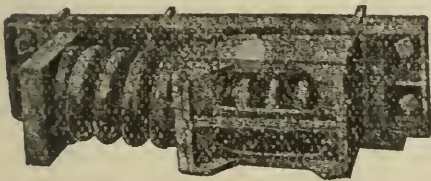
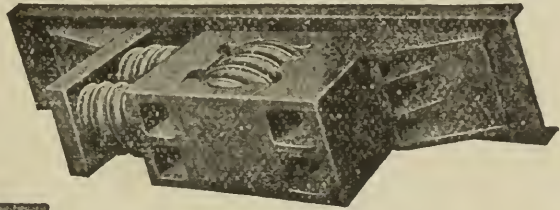
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Vol. XVIII.
No. 3**Montreal, Can. Mar. 11, 1919**\$1.00 per year
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PROCEEDINGS OF THE CANADIAN RAILWAY CLUB.

Windsor Hotel, Montreal,
11th March, 1919.

Mr. T. C. Hudson (President) in the chair.

MEMBERS PRESENT.

A. Allan	J. Dempsey	A. Johnson
W. W. Barry	E. Deschene	C. V. Johnson
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Frank Bergen	J. D. Desparois	E. J. Kelly
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J. Bourgouin	E. Duchesne	C. Letendre
L. Boughton	S. B. Dunlop	R. P. Liddell
Walter Bourgault	Arthur Duval	B. K. Linagh
C. Brady	H. J. Dyke	R. L. Lindstrom
F. P. Brady	W. H. Estabrook	E. E. Lloyd
M. Broaderup	W. E. Evans	T. Marshall
L. M. Brooks	F. O. Farey	C. Martin
P. A. Brooks	J. B. Ferguson	J. McCarthy
A. E. Burgeois	F. E. Fox	T. J. McDonagh
J. Burns	H. Freeman	A. McDonald
L. Campbell	F. J. Gibson	J. R. Mackie
M. M. Campbell	W. Gillespie	H. B. McMullen
J. W. Carter	W. A. Gregory	J. B. Macpherson
W. A. Chapman	R. E. Hall	E. S. McNab
W. R. Clark	J. Halliwell	E. J. McVeigh
J. R. Connell	W. T. Hawes	R. McVicar
C. H. N. Connell	Jas. Hay	W. J. Miller
A. Couillard	John Hendry	Wesley Miller
M. Coleman	E. Hodgskin	J. Millington
W. T. Coleman	Norman Holland	C. G. Mitchell
R. C. Cookman	G. F. Hudson	A. Moulart
A. Crumpton	W. C. Hunter	F. Morin
W. Cowap	H. A. Illsey	J. Morris
A. E. Davies	H. H. James	M. J. Mullally
G. deAngelis	L. Jehu	W. B. Murray

A. Neagle	H. Rake	H. P. Swinton
E. A. Nix	J. Riccio	H. H. Symmes
W. J. Nystrom	E. J. Robinson	S. G. Taylor
Jas. Ogden	J. H. Rodgers	H. Tetlaw
J. W. Palme	H. J. Rogers	J. E. Tinkler
R. W. Peacock	G. W. Robb	G. T. Veary
H. Pearce	W. J. Robider	W. Ward
A. T. Perrin	A. Riddington	C. W. Wells
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F. Phillips	W. H. Sample	J. W. Winterson
W. F. Pomphrett	H. W. Sharpe	W. H. Yost
A. Pope	B. F. Shortley	Jas. Powell
J. S. Primeau	E. T. Spidy	and others.
W. Prowse	W. H. Stewart	

Chairman :

The members will please come to order. The first order of business is the signing of the cards. The minutes of the previous meeting have been printed and distributed. If there is no objection we will consider them as read. The next order of business is the remarks of the chairman. I do not intend to take up any of your time to-night, but we will move to the next business. The Secretary will read the applications of new members.

Secretary :

The following applications for membership have been received and passed upon by the executive committee and are submitted for your approval.

NEW MEMBERS.

- M. Broaderup, Stores Foreman, C. P. R., Angus Shops, 754 Fifth Ave., Rosemount.
Lorne Campbell, Manager, B. & S. H. Thompson Co., Montreal.
W. J. Corbett, Commercial Traveller, 533a St. Denis St., Montreal.
F. W. Craig, McCord & Co., Brantford, Ont.
W. S. Fallis, Managing Director, Sherwin-Williams Co. of Canada, Ltd., Montreal.
Arthur Johnston, Armstrong, Whitworth Co., 428 Riverside Drive, St. Lambert.
C. W. Johnston, General Passenger Agent, G. T. R., 124 Edison Ave., St. Lambert.

A. O. Seymour, General Tourist Agent, C. P. R., Montreal.

S. A. Warner, Electrical Inspector, G. T. R., Montreal.

T. H. Williams, Chicago-Cleveland Car Roofing Co., 538 Railway Exchange, Chicago.

Chairman:

The members have heard the names read by the Secretary, which have already been passed upon by the Executive Committee. A motion favoring their acceptance will be in order.

Mr. Nix:

I move they be accepted.

Mr. Crumpton:

Seconded.

Chairman:

It has been moved by Mr. Nix, seconded by Mr. Crumpton, that these names be accepted. Are all in favor? Please signify in the usual manner.

Carried.

Chairman:

Report of Standing Committee—none.

Unfinished business—none.

New business. Has any member anything he wishes to bring forward to-night? No new business.

Reports of Special Committees—none.

Unfinished discussion of paper read at previous meeting—none.

Chairman:

Mr. Holland is going to give us a paper to-night on the history of varnish making, and will put a series of pictures on the screen to illustrate his lecture. I will now ask Mr. Holland to come forward.

Mr. Holland:

The chairman has been good enough to make a few very kind remarks about me. I cannot help thinking of what the speaker at the Rotary Club said to-day, when he had also been referred to in a complimentary manner by the chairman at that meeting. In his reply he mentioned that we all like a little flattery, as it is human nature to appreciate kind re-

marks. He said, however, "If I had my way in this life, there would be a lot more 'taffy' and a lot less 'epitaphy.' "

The lecture part of this address has been written out so as not to take up too much time. The tendency in a subject as complex as varnish manufacture would be to wander from the point, and for that reason the remarks have been written out.

"HISTORY OF VARNISH MAKING FROM B. C. TO THE PRESENT DAY."

"Rooms shalt thou make in the ark, and thou shalt pitch it within and without with pitch."

This is probably the oldest record we have of an order for varnish, or rather a protective coating on a structure. We do not claim to have taken the particular order for the pitch which was used on the ark, but I feel sure that one of our travellers was at least on the ground.

Prof. Sabin relates a very pretty story of the origin of the name "Varnish," as follows:

"In the middle of the third century, B. C., Berenice was Queen of Cyrene. She was a very beautiful woman with long golden hair, which was truly her 'crowning glory.' Once, when her husband, King Ptolomy III., was away on a war, she pledged the sacrifice of her hair to Venus, Goddess of Love, for his safe return. He came back triumphant and the Queen fulfilled her sacrifice. Naturally the story lived in tradition and when the Greeks first found amber, on the far shores of the Baltic, its beautiful translucent golden hue prompted them to call it after Berenice, of whose renowned hair it reminded them. In the course of time the word 'Berenice' became successively Veronica, Verenices and Ver-nix, from which we get our word 'Varnish.' "

GENERAL CLASSIFICATION.

Varnishes may be divided into two general classes, viz: Spirit Varnishes and Oil Varnishes.

Spirit Varnishes are those which are made by dissolving a gum in a solvent. They include Dammar Varnish, Shellac, Spirit Copal, etc. Oil Varnishes would include those which are made by first melting a gum, adding oil and cooking to a pre-determined temperature. This temperature varies according to the purpose for which the varnish is to be used. The cooked material is then allowed to cool sufficiently so that the

necessary thinner, or solvent may be added without undue evaporation.

SPIRIT VARNISHES.

Under Spirit Varnishes we will merely consider the two most important ones, viz: Dammar and Shellac.

Dammar Varnish is made from a very light colored gum, called Dammar, dissolved in turpentine. Its principal use, as far as the regular trade is concerned, is for coating paper, It is used for maps, etc.

It is only valuable for interior work, as it has no weather resisting properties.

Shellac Varnish is made by dissolving Shellac gum in Methylated Spirits or Wood Alcohol. It is used principally as an undercoating or first coat on furniture, woodwork, etc. It should never be used on exterior work, nor is its use advisable at any time on floors, when varnish is to be applied later.

OIL VARNISHES.

Oil Varnishes may be divided roughly into what are known as "Short Oil" and "Long Oil."

Short Oil Varnishes are used principally for interior work and the under coats or first coats on carriages and automobiles. Long Oil Varnishes include Boat and Spar Varnishes. Carriage, Automobile and Railway Finishing Varnishes and exterior varnishes for architectural purposes.

SYSTEM OF MANUFACTURE.

In a general way the system of making Oil Varnishes is to place in a copper kettle a weighed quantity of gum. This is heated to a temperature of anywhere from 500 to 700 degrees Fah. Certain of the volatile matters pass off in the shape of fumes. When the gum has been sufficiently cooked and is at the correct temperature, a stated quantity of oil is added. The resulting mixture is cooked to a specified temperature, allowed to cool and then thinned with turpentine, or such other thinner or solvent as may be required for the particular use to which the varnish is to be put. This covers the manufacture in a general way.

MATERIALS USED.

The principal materials which enter into the manufacture

of varnishes may be classed under the heading of thinners, gums and oils.

THINNERS.

Under the reading of thinners we have methylated spirits and wood alcohol; petroleum products and turpentine.

Methylated spirits is supplied entirely by the Government, as they control the production. The wood alcohol situation is practically controlled by one company. I cannot tell you very much about the manufacture of alcohol, as it is carried out "on the quiet" i. e., it is a "still" business. Speaking of alcohol, reminds me of a story.

A PROPOSAL.

It was after his eleventh cocktail that he proposed to me. "Dearest," he said, "the bubbling wine in my glass reflects the sparkle of your eyes. The graceful curve of the bottle counterfeits your slender form. Your touch soothes me as a cool fog at midnight brushing against my hot cheeks. The mysterious fragrance of early morn is in your breath. Beloved, I adore you. Marry me."

"Come, Freddie," I replied gently, "you proposed to me ten years ago and I married you. We must go home now. You are drunk."

The petroleum products at present used in varnish manufacture are benzine and the heavy naphthas. The petroleum industry has of course been affected to a very great extent by the war, and, like all other products, these have advanced enormously in price. Those of you who run motor cars know what the war has done to the price of "gas."

TURPENTINE.

Turpentine comes almost entirely from the Southern States. It is obtained from the resinous excretions from various species of pine and other coniferous trees. It was formerly known as "oil of turpentine" or "spirits of turpentine." The general expression to-day is turpentine or "turps." The resinous matter which exudes from the pine trees is placed in a still, heated by means of steam. The volatile part which comes over is turpentine, mixed with a certain proportion of water, etc. This is purified by settling or by a second distillation. The residue left in the still is resin, or what is commonly known as "rosin." This rosin is sold according to grades, the finest being known as "Water White" or "W. W..." and the other grades passing along through various colors into one which is almost black.

SHELLAC.

Shellac is not, as has been supposed, the gum of a tree, but is produced by tiny insects. The insects responsible for the existence of lac or shellac belong to a family, the translation of whose Latin name means "scales." Adulterated shellac might be spoken of as having been weighed in the "scales" and found wanting. The insects live about six months.

Shellac is produced principally in the South of India and is more or less cultivated. The insect punctures the bark of the small twigs on certain trees and deposits its eggs. It sucks up sap from the tree and this exudes from its body in the form of a reddish brown substance, which hardens to a gummy mass. This encrustation gradually accumulates to about four or five times the thickness of the twig. These twigs are broken from the trees by the natives and in this condition are known as "Sticklac." This sticklac is collected and removed from the twigs by boiling in iron cauldrons. It is then strained and filtered through flannel cloths to free it from foreign matter. It is run into thin flakes called "Shell-lac," or when made into thick round pieces is called "Button-lac."

Shellac is collected four times a year, the most important or "By-sackie" crop being gathered in April. It reaches the factories in May or June. The finest crop is the "Koosmi," and is gathered about November-December. The shellac as usually received in commerce is in the form of flakes and varies from an extremely light amber to a dark brown color.

White or bleached shellac is obtained by boiling ordinary shellac in a caustic solution and then passing a current of chlorine gas through the mixture. This chlorine throws the gum out of solution in a white form and it is then dried and ground and comes on the market as white or bleached shellac. Bleached shellac is not produced in the primary or original markets, *i. e.*, in India, but is made in either England or the U. S.

GUMS.

Gums may be divided into crop gums and fossil gums (not to mention chewing gums, which are crop gums chewed by fossils). The crop gums are those which are obtained from trees at stated periods; whereas the fossil gums are the remains of forests long extinct. Fossil gums are mined just the same as coal.

Mr. Holland then went on to speak of the various kinds of gums and their sources. He dealt with East India, Manilla and Pontianac, Congo, Sierre Leone and Kauri Gums. He went very fully into the history of Kauri Gum and mentioned that the price had risen from \$25.00 a ton in 1853 to upwards of \$1,000 a ton to-day for a good grade. The North American

continent consumes much the larger percentage of the production of Kauri, as it most likely does of all other gums as well.

He spoke of the method of locating Kauri, which is by prodding the ground with a long steel spear. The gum is then dug out by means of trenching, etc.

Kauri Gum is practically the only one of the commercial gums which is handled almost entirely by civilized peoples. All the other gums are handled primarily by savages or semi-civilized tribes.

OILS.

The different oils used in varnish manufacture were then taken up, the principal ones being linseed oil and China wood oil. The method of growing flax seed was referred to and the fact that the five countries which supply the greater part of the seed of the world are Russia, India, United States, Canada and the Argentine. The war and the subsequent difficulty of getting shipping had interfered with obtaining Argentine seed. This, in addition to the fact that Russia was practically out of the market and the shipping situation from India was in the same condition as that from the Argentine, had caused the price of oil to rise to almost unprecedented figures. The consumption of seed for Canada and the United States was mentioned to be in the neighborhood of 30,000,000 bushels per annum or more than double the crop produced by these two countries themselves.

The next oil taken up was China wood oil. Mr. Holland referred to the fact that his pioneer work on China wood oil, with regard to its use in Finishing Varnishes, was largely responsible for the fact of his being considered more or less of an expert in the manufacture of varnishes. He referred to his having been the first technical man who had the courage to come out in print and say that this oil could be used in the very highest grade of railway, automobile and other varnishes. He referred to the fact that all varnish companies were able to use China wood oil in the cheaper varnishes by means of a treatment common to them all. This treatment of itself, however, absolutely prevented its use in the highest grade of Finishing Varnish. His company had been able to develop a method which had entirely done away with the old style of treatment and which made the oil applicable to every type of varnish.

The great advantages of China wood oil are that it dries very much better than Linseed oil and gives a much tougher and more rubberlike film. It is absolutely waterproof. This

waterproof quality of China wood oil is what makes it so valuable in the manufacture of high grade exterior varnishes. This latter statement is of course, based on the proviso that the oil shall be treated by a special method and not in the manner in which it is used in the manufacture of the cheaper varnishes.

The reason why China wood oil was so slow in coming into use was that it dried with a peculiar "frosted" or "alligatored" appearance and this peculiarity had to be overcome. This particular feature of China wood oil was illustrated by means of lantern slides later on.

The oil is called "wood oil" because in China it is applied to practically everything made of wood. The white races have christened it "China wood oil" because it comes from China. What first drew the attention of Westerners to this oil was the peculiar waterproof qualities possessed by Chinese junks and boats.

The fact was referred to that before the war China wood oil could be bought in Montreal for about 7c. per pound, whereas during 1918 it had risen to over 30c. per pound. Over 5,000,000 gallons of this oil were imported into the States and Canada during 1917. This figure represents about 40% of the total Chinese production.

The oil is produced from a nut which grows on a tree called the Tung Tree. The nuts are gathered and the oil is expressed from the "meat" in a very primitive manner. The States has been making some experiments with a view to growing these trees over here, but we understand that the war has delayed the work being done in this connection.

In China the finished oil is brought down to the coast in paper lined baskets which hold approximately 133 lbs. This weight is known to the Chinese as a "Picul." This name, however, has nothing whatever to do with any of the Heinz "57 varieties," as we feel sure that the Chinese had the name long before Heinz came into existence.

Mr. Holland then gave about 150 lantern illustrations which went thoroughly over the whole industry. These illustrations were divided under the following heads:—

General Views.

The Petroleum Industry.

The Turpentine Industry . "

Shellac.

Kauri Gum.

Linseed Oil.

China Wood Oil.

Illustrations of Wearing Tests of Varnishes.

Chairman :

Mr. Holland is prepared to answer any questions in connection with his lecture or the illustrations he has shown, which the members may wish to ask. We would like to hear from some of the storekeepers who have been kicking about the quality of varnish they have been supplied with.

Mr. E. A. Nix :

In the remarks which Mr. Holland made before putting on the slides I understood him to say that turpentine was made from various trees in the south. I was born in the south and raised there, and it has always been my understanding that turpentine was made from only one tree and that was the long-leaved yellow pine. There may be others, but I have never heard of them.

Mr. Holland :

Mr. Nix misunderstood me. I did not say that turpentine was made from various trees in the south, but did say it was produced from three or four species of tree of coniferous growth. We get turpentine from Canadian pine as well. Several years ago I was interested in a Canadian plant and sunk some money in it. We produced turpentine but the cost was prohibitive. When the southern turpentine was selling at \$1.40 we made money, but when the price dropped to 50 cents in the south, we had to shut down. There are quite a number of varieties of southern pine. I do not want to burden Mr. Nix with the Latin names.

Mr. Nix :

Do you get the same grade of turpentine from the Canadian pine?

Mr. Holland :

No. The American turpentine is far better.

Mr. Nix :

You may be right about that. I thought that the long-leaf yellow pine was the only tree they made turpentine from.

Mr. Blumenthal.

Can you say anything about the varnish made of cullulose? We have heard a lot about it and I understand it is used largely for aeroplane wings and similar appliances.

Mr. Holland :

The making of cellulose acetate, etc., is controlled largely

by two or three companies. It is a specialty. So far it has not invaded our field to any extent. I do not think it will do so in my day.

Mr. Blumenthal:

This cellulose is being advertised pretty extensively and they are in the market for the sale of this particular variety of varnish. I think you will hear much more about them within the next few years.

Mr. Gordon Mitchell:

I would like to ask Mr. Holland if he can tell me where the Chinese got this word "Picul" from. They evidently use it as a measurement. I think they must have stolen it from the Scotch. I will give you an illustration:

A cargo of guano was sent to a certain port and a farmer there who had three acres and a cow came down to buy some of it. They told him it was fine for the land and ask how much he wanted to take. He said, "I think I will just take a Picul."

Mr. Holland:

Perhaps Mr. Mitchell knows that St. Patrick was a Scotchman. It is also rumored that Confucius was a Scotchman and that may account for the use of the word "Picul."

Chairman:

It has been customary, as you know, to give one paper of this kind each year, and we thought it was only right, on this occasion, to invite a Canadian manufacturer to give it. In former years we have had papers of this kind given by Americans, but this year we have endeavored to have all the papers read before the club prepared by Canadians, so as to make it as national as possible.

The paper for our next meeting is on "Passenger Car Trucks," and is to be given by Mr. W. J. Hyman of the Grand Trunk. This will be the last paper of the season before our meeting in May, when the elections will be held.

If there is no further discussion I will declare the meeting closed, but would first like to hear a vote of thanks proposed to Mr. Holland for his entertaining lecture to-night.

Mr. W. H. Sample:

I move that we extend a hearty vote of thanks to Mr. Holland for his able paper and the manner in which he described

the manufacture of varnish from its early history up to the present date.

Mr. Blumenthal:

I take pleasure in seconding that.

Secretary:

For the information of the members I might say that the slides shown to-night were furnished by Mr. Holland at his own expense. It is very kind of him to entertain us as he has done to-night, jovially and tersely, and I think the vote of thanks is well in order.

Chairman:

You have all heard the motion. Please signify in the usual way.

Carried (applause).

Mr. Holland, it gives me pleasure to convey to you the thanks of this Club. You are one of its hardest working members and have always endeavored to help it in every way possible. We appreciate the trouble you have gone to in preparing and giving us this paper.

Chairman:

The next order of business is the formation of a committee which it is customary to appoint of representatives from the different leading railways in Canada to consider and report to the M. C. B. convention any changes they recommend in the M. C. B. rules. With the sanction of the Club I will appoint to that committee, Mr. James Coleman, Superintendent, Car Department, Grand Trunk Railway; Mr. G. E. Smart, General Master Car Builder, Canadian National Railways, and Mr. W. J. Robider, General Master Car Builder, Canadian Pacific Railway. If any of the members feel that others should be on this committee you have the privilege of naming them, but I would advise that the gentlemen named have been approved already by the Executive Committee. I would, however, like your vote on the matter to strengthen me in making these appointments. Will you please signify in the usual way—carried. I will declare the appointments approved unanimously.

If the Secretary has no announcement to make we will bring the meeting to a close. We thank you for the large attendance to-night to hear Mr. Holland. Coffee and sandwiches have been provided in the room at the rear and we would like all members to stay.

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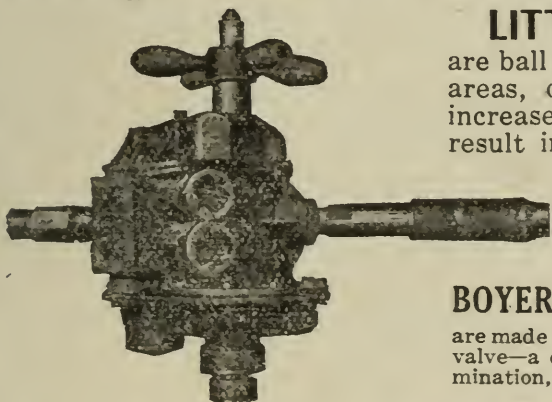
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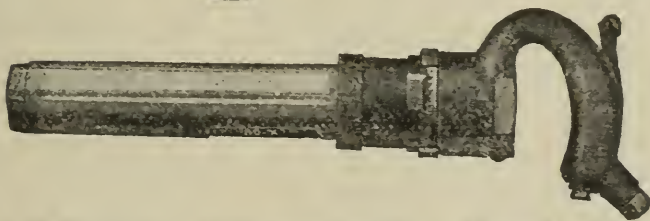
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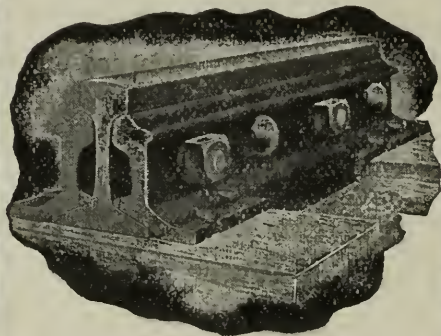
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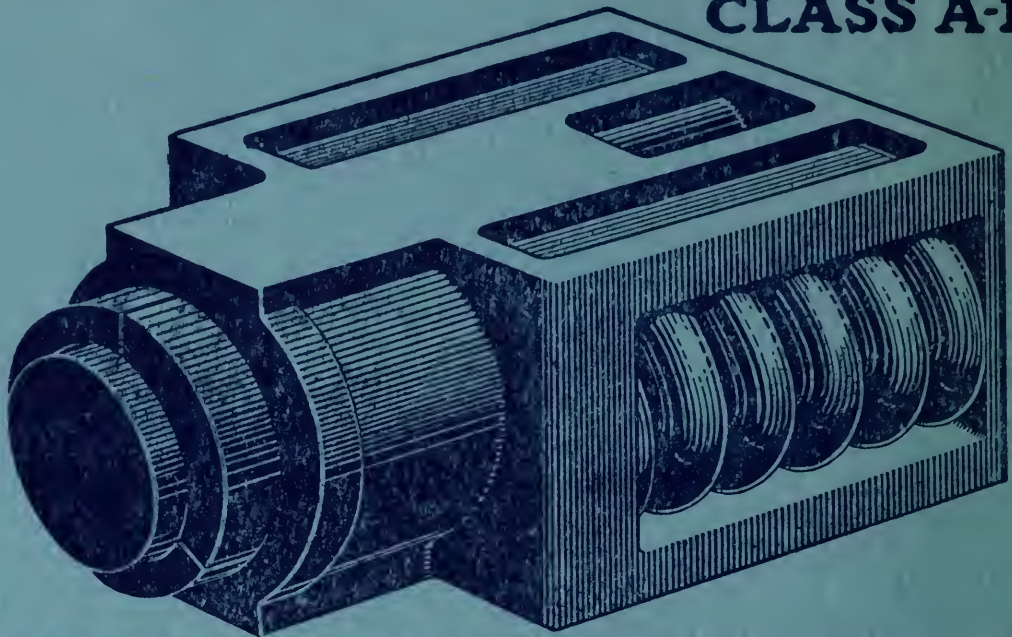
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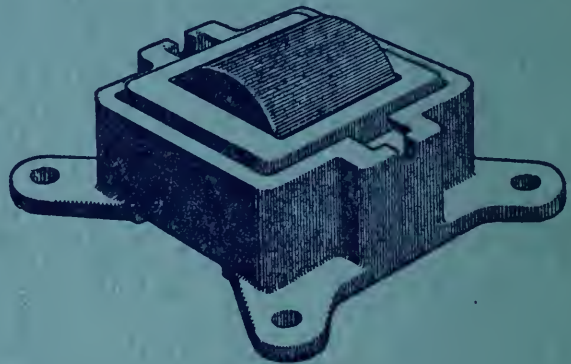
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